This report is required by law (7 USC 2143). Failure to report according to the regulations can result in an order to cease and desist and to be subject to penalties as provided for in Section 2150.

See reverse side for additional information.

Interagency Report Control No 0180-DOA-AN

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

ANNUAL REPORT OF RESEARCH FACILITY

(TYPE OR PRINT)

1. REGISTRATION NO. 43-R-0048 CUSTOMER NO. 1461

FORM APPROVED
OMB NO. 0579-0036

2. HEADQUARTERS RESEARCH FACILITY *(Name and Address, as registered with USDA, include Zip Code)*

UNIVERSITY OF MISSOURI-COLUMBIA
205 JESSE HALL
COLUMBIA, MO 65211

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS*(sites)*

b2 high, b7F

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY *(Attach additional sheets if necessary or use APHIS FORM 7023A)*

A. Animals Covered By The Animal Welfare Regulations	B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes.	C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs.	D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used.	E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. *(An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report)*	F. TOTAL NO. OF ANIMALS (Cols. C + D + E)
4. Dogs	7	140	420		560
5. Cats	19	40	21		61
6. Guinea Pigs		7	24		31
7. Hamsters		24	99		123
8. Rabbits		143	140	6	289
9. Non-Human Primates					
10. Sheep		25	8		33
11. Pigs	246	317	682		999
12. Other Farm Animals					
13. Other Animals					
Gerbils		96			96

ASSURANCE STATEMENTS

1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.

2) Each principal investigator has considered alternatives to painful procedures.

3) This facility is adhering to the standards and regulations under the Act, and it has required that exceptions to the standards and regulations be specified and explained by the principal investigator and approved by the Institutional Animal Care and Use Committee (IACUC). A **summary of all the exceptions is attached to this annual report.** In addition to identifying the IACUC-approved exceptions, this summary includes a brief explanation of the exceptions, as well as the species and number of animals affected.

4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL

(Chief Executive Officer or Legally Responsible Institutional official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O. OR INSTITUTIONAL OFFICIAL	NAME & TITLE OF C.E.O. OR INSTITUTIONAL OFFICIAL *(Type or Print)*	DATE SIGNED
(b)(6), (b)(7)(C)		11/28/2006

APHIS FORM 7023
(AUG 91)

(Replaces VS FORM 18-23 (Oct 88), which is obsolete

PART 1 - HEADQUARTERS

1. Registration Number: 43-R-0048 / 1461

2/3. Species (common name) & Number of animals used in this study:

Rabbits (6)

4. Explain the procedure producing pain and/or distress.

Colorectal distension is a model of visceral pain that is commonly used in human volunteers as well as conscious rabbits. We have evaluated the physiological effects of colorectal distension in chronically instrumented, anesthetized and conscious rabbits. Colorectal distension was chosen as a nociceptive stimulus for use in conscious, chronically instrumented rabbits because it met the following criteria: 1) It is titratable (i.e. variable intensity); 2) It is short-lived (only present while the stimulus is on); 3) It is repeatable; 4) It increases arterial blood pressure approximately 10 mmHg; 5) It does not cause tissue damage; 6) It is responsive to opioid analgesia; and 7) It is feasible in our conscious, chronically instrumented rabbit preparation. This project evaluated the effects of colorectal distension on cardiovascular and respiratory responses to environmental stress and blood loss. Prior to the first colorectal distension experiment, all rabbits underwent training to become accustomed to colorectal balloon catheter placement. Training sessions were performed for at least one week prior to beginning colorectal distension experiments During the referenced time period, we performed colorectal distension experiments in 6 conscious rabbits. Rabbits sat quietly in the rabbit box following balloon catheter placement. No rabbits have exhibited behavioral signs of pain or distress during or after a colorectal distension experiment, after the balloon has been removed, or when observed in their home cages. Blood has never been observed on the balloon at the time of removal or in the feces. The distal colon of rabbits euthanized after colorectal distension experiments were evaluated grossly by two veterinarians and no evidence of tissue damage was observed. Based upon the data we have collected during colorectal distension in conscious rabbits, we are confident that this model of visceral pain is short-lived, responsive to opioid analgesia, and causes no lasting tissue damage. In addition, in all experiments, care has been exercised to limit the duration of colorectal distension to the minimum time required to complete experiments.

5. Provide scientific justification why pain and/or distress could not be relieved. State methods or means used to determine that pain and/or distress relief would interfere with test results. (For Federally mandated testing, see Item 6 below)

Treatment of blood loss in humans and other animals is an important medical problem. Although blood loss in the real world is usually associated with simultaneous stress and/or pain, almost nothing is known about the effects of stress and/or pain on the cardiovascular response to blood loss. We feel that evaluating cardiovascular, respiratory, and central nervous system responses to blood loss in a conscious animal in the presence of environmental stress and pain may best approximate the response to traumatic blood loss. In other words, we believe that our preparation and approach addresses clinically relevant blood loss. The proposed project investigates this important question. Rabbits serve as a model to better understand the response to blood loss in all animals. Rabbits will undergo blood loss during exposure to an environmental stressor (air-jet) and nociceptive sensory input (colorectal distension). The ultimate goal of these studies is to improve the medical management of patients (humans and other animals) who lose blood. This project evaluates the effect of pain and stress on the integrated neurohumoral and hemodynamic response to blood loss and therefore requires an intact animal model. This project cannot be done with isolated cells or tissues because many cells and tissue types, as well as organ systems, are involved in the response to blood loss. In addition, the normal response to pain requires an intact central nervous system. Thus, we have to use intact animals for the proposed studies. We have evaluated the effect of colorectal distension on cardiovascular parameters in halothane-anesthetized rabbits, as well as conscious, chronically instrumented rabbits. While colorectal distension in both conscious and anesthetized rabbits is associated with increased arterial pressure, the response is significantly blunted in anesthetized rabbits. In other words, the physiologic response to pain is altered by anesthesia and acute tissue trauma (surgery). Thus, since our studies are designed to examine the effects of painful sensory input on cardiovascular and respiratory control, it is necessary to use conscious, chronically instrumented rabbits. The effect of pain on cardiovascular and respiratory control during hemorrhage in conscious animals has not been studied. Despite the obvious importance of this area in terms of medical treatment of traumatic injury, our literature searches as well as consultation with experts in this area indicate that the information which will come from the proposed study is new information which is not presently available. A search of two data bases (Current Contents:1993 - 2005 & Biological Abstracts: 1980 - 2005) on August 31, 2005 using the key words: "effect of pain and hemorrhage," "effect of pain and response to blood loss," and "effect of pain and cardiovascular control" yielded three unrelated results: 1) Hanaue, H. et al. 1987. Postoperative intravenous administration of lysine acetylsalicylate effect on pain relief and platelet function. Clinical Therapeutics. 9(2);159-166. 2) Bancroft, J. and D. Rennie. 1995. Perimenstrual depression: Its relationship to pain, bleeding, and previous history of depression. Psychosomatic Medicine. 57(5); 445-452. 3) Bundsen, P. et al. 1981. Pain relief in labor by transcutaneous electrical nerve stimulation - a prospective matched study. Acta Obstetricia et Gynecologica Scandinavica. 60(5); 459-468.

6. What, if any, federal regulations require this procedure? Cite the agency, the code of Federal Regulations (CFR) title number and the specific section number (e.g., APHIS, 9 CFR 113.102):

Agency: none CFR:

Approval Status:
Approved/Disapproved By:
Date:

Disapproved Reason: